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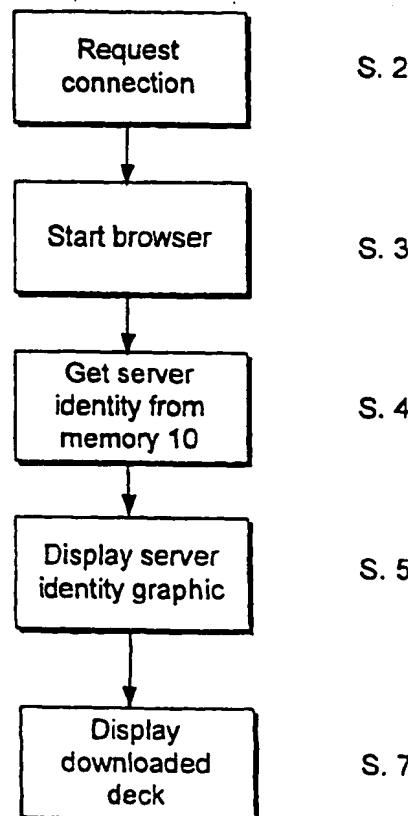
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(54) Title: DISPLAYING SERVICE PROVIDER IDENTITY



(57) Abstract: A mobile cellular telephone handset (1) is WAP enabled. Browser connection settings are configured so that whilst connection is being made to a WAP server, the user is provided with a graphical display that indicates the identity of the service provider for the server.

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Displaying Service Provider Identity

This invention relates to connecting a mobile telecommunications device operable as a client, to a server that acts as a data service provider, and has
5 particular but not exclusive application to mobile telephone handsets for use in a cellular network and also personal digital assistants (PDAs).

Conventional mobile telecommunications devices, such as telephone handsets, have been designed primarily for speech calls and have only a
10 limited capability for handling data. For example, in GSM, a short message service (SMS) has been provided to permit the user to send and receive short text messages that can be transmitted through a cellular public land mobile network (PLMN). More recently, recommendations have been developed to provide a wireless application protocol (WAP) to promote common standards
15 and specifications for data services that operate over wireless communication networks. WAP enabled telephone handsets have been developed which allow the user to access remote servers. Data content is provided in a markup language, similar to conventional hypertext markup language (HTML), known as wireless markup language (WML), which is configured to allow a
20 page of HTML data to be display as a deck of individual cards which are of a size suited for display on the relatively small display screen usually available on a mobile device such as a cellular telephone handset or PDA.

A WAP server can be accessed by dialling an individual telephone number
25 associated with a WAP gateway which acts as a proxy server between the WAP server itself and the mobile device which acts as a client. Thus, individual WAP servers can be accessed by a user, by dialling the telephone numbers associated with the individual WAP gateways that provide access to the servers.

When a WAP enabled mobile telecommunications device is first connected for use with a mobile network, data concerning the telephone numbers, IP addresses and other initialisation information is supplied to the mobile device through the mobile network, in the form of a data message. The initial data is

5 transmitted in a so-called WAP push. In WAP, the transfer of data packets is often termed a "push" and/or a "pull". A pull can be described as a terminal (e.g. mobile handset) accessing a location where provider information is stored and retrieving it, and optionally determining whether the information has been updated to determine whether it should be retrieved. A push can be

10 described as the opposite to a pull, i.e. the server maintains address data necessary to transfer updated information to the terminal so that the data can be sent to the terminal.

Where the network is GSM the push with the initialisation information may be

15 sent using a short message service (SMS) or as an unstructured supplementary data (USSD) as a bearer. Other bearers may be used, of course, depending on the particular network. In this way, the mobile device is provided with a number of pre-set server addresses, which can be selected by the user to provide access to information services, commercial organisations

20 and the Internet in general. By providing the settings initially as a push to the handset, the number of keystrokes that need to be performed on the device to access a server are reduced significantly, which simplifies operation for the user, particularly with the limited keyboard usually associated with the mobile device.

25 However, when an individual setting is selected by the user in order to make a connection to a WAP server, no indication is given to the user concerning the identity of the service provider for the server, whilst the connection is being established. This gives rise to problems in certain circumstances. For

30 example, when the mobile device roams from its home network to another, it may be preferable to connect to a WAP gateway associated with the roamed network to obtain data services at a local network charge rate. However,

when the mobile device roams, selection of one of its pre-set server settings may attempt to make a connection through the roamed network to the home network in order to access the server associated with the setting pre-programmed into the handset. The identity of the server to which connection
5 is being made, is revealed once the connection has been established. Thus, the user only becomes aware that the connection has been made to a non-optimum server, when roaming, after the connection has been made, which wastes time. Also, because the connection will have been made through a roamed network, which may be in a different country, an unwanted relatively
10 high call charge will have been incurred.

Furthermore, when operating with its home network, the mobile device may have a choice of servers that provide a particular type of information. One of the servers may provide the information at no cost whereas another may
15 impose a charge. The user is aware of which server provides the free service. Thus, when one of the pre-programmed settings in the device is used to make a connection, it may connect to the server that imposes a charge for the service. However, this is only revealed to the user when the connection has actually been made rather than during the connection process itself, which
20 wastes time and may also incur unwanted expense.

The present invention seeks to overcome these problems.

In a first aspect, the invention provides a mobile telecommunications device
25 operable as a client for a server that acts as a data service provider, including a transmitter to transmit a request to connect the client to the server through a mobile telecommunications network, and a display configured to display information to the user of the mobile device, whilst the connection is being established, representative of the identity of the data service provider for the
30 server to which the connection is being made.

Thus, in accordance with the invention, the user is provided with information concerning the identity of the data service provider for the server, whilst the connection is being made, so that if the user determines that the connection does not best serve the intended purpose, it can be aborted, without having to

- 5 wait for the connection actually to be made, thereby saving time and reducing expense.

The device may include a memory to receive the data corresponding to the displayed information, from the network. The displayed information may be

- 10 graphical information, which may be stored in the memory prior to commencing the making of the connection and retrieved for display whilst the connection is being made.

The data may form part of an ensemble of setting data provided for the device

- 15 at its initialisation e.g.. when initially connected to the network. Alternatively, the data may be provided in response to a request to make the connection.

The display may be operable to provide an indication that the connection is in

the course of being made, for example by displaying graphical image which is

- 20 animated whilst the connection is being made.

The device is particularly suited to use with WAP and may comprise a mobile cellular telephone handset or a PDA.

- 25 The invention also includes a method of connecting a mobile telecommunications device as client to a remote server that acts as a data service provider, comprising transmitting a request to connect the client to the server through a mobile telecommunications network, and whilst the connection is being established, displaying information to the user of the
- 30 mobile telecommunications device representative of the identity of the data service provider for the server to which the connection is being made.

The invention further includes a server that acts as a data service provider for a mobile telecommunications device operable as client, including means responsive to a request to connect the client to the server through a mobile telecommunications network, to supply data corresponding to the identity of

5 the data service provider to the device so as to permit the device to display information, whilst the connection is being established, representative of the identity of the data service provider for the server.

In order that the invention may be more fully understood an embodiment
10 thereof will now be described by way of example with reference to the accompanying drawings in which:

- Figure 1 is a schematic block diagram illustrating a mobile telephone handset which can communicate through a home PLMN (PLMN A) to a WAP server or
15 through a roamed network (PLMN B) to another WAP server;
- Figure 2 is a schematic block diagram of the circuitry of the mobile handset shown in Figure 1;
- Figure 3 illustrates a sequence of displays provided to the subscriber for the handset shown in Figure 1, during the establishment of a connection to a
20 WAP server, according to a conventional procedure;
- Figure 4 is a schematic illustration of a signal interchange which occurs between the WAP client and server processors, in accordance with the invention;
- Figure 5 is a schematic block diagram of process steps that occur at the handset whilst a connection is being made to the WAP server; and
- 25 Figure 6 is a schematic illustration of the displays provided to the user of the handset during the establishment of a connection to a WAP server, in accordance with the invention.
- 30 In Figure 1, a mobile station in the form of a battery driven telephone cellular handset 1, is shown schematically in radio communication with PLMN A, which acts as its home network. PLMN A is operated by a

telecommunications company – Teleco A. A second network PLMN B is also shown, operated by Teleco B. The handset 1 can roam from its home network PLMN A to network PLMN B.

- 5 Considering the mobile handset 1, it includes a microphone 2, keypad 3, soft keys 4, a liquid crystal display 5, earpiece 6 and internal antenna 7. As will be explained in more detail, the handset 1 is WAP enabled.

The circuitry of the handset 1 is shown in more detail in Figure 2. Signal processing is carried out under the control of a digital micro-controller 8 which has an associated RAM 9 and flash memory 10. Electrical analogue audio signals are produced by microphone 2 and amplified by pre-amplifier 11. Similarly, analogue audio signals are fed to the earpiece 6 through an amplifier 12. The micro-controller receives instruction signals from the keypad and soft keys 3, 4 and controls operation of the LCD display 5.

Information concerning the identity of the user is held on a smart card 13 in the form of a GSM SIM card which contains the usual GSM international mobile subscriber identity and encryption K_i that is used for encoding the radio transmission in a manner well known *per se*. The SIM card 13 is removably received in a SIM card holder 14. Radio signals are transmitted and received by means of the antenna 7 connected through a rf stage 15 to a codec 16 configured to process signals under the control of a micro-controller 8. Thus, in use, for speech, the codec 16 receives analogue signals from the microphone amplifier 11, digitises them into a form suitable for transmission and feeds them to the rf stage 15 for transmission through antenna element 7 to PLMN A shown in Figure 1. Similarly, signals received from PLMN A are fed through the antenna element to be demodulated by the rf stage 15 and fed to codec 16 so as to produce analogue signals fed to amplifier 12 and earpiece 6.

The handset 1 is WAP enable to and capable of receiving date in a predetermined channel e.g. for GSM, at 9.6Kbit/sec. Also, the handset may be configured to receive a high speed circuit switch data (HSCSD) according to the GSM recommendations, at a data rate from 14.4-43.2 Kbit/sec.

- 5 It will however be understood that the invention is not restricted to any particular data rate and that higher rates could be used. The WAP content and its applications are specified in a well known set of content formats based on familiar www content formats. WAP is disclosed in the Wireless Application Protocol Architecture Specification; version 30 April 1998, published by the
10 Wireless Application Protocol Architecture Working Group (see also <http://www.wapforum.org/docs/technical.htm/arch-30-apr-98.pdf>).

As known in the art, the WAP environment (WAE) provides a browser e.g. a

micro-browser operable on the handset as a client, for connection to WAP

- 15 servers. The browser is configured to operate with WML which, as previously mentioned comprises a lightweight markup language similar to HTML but optimised for use in hand-held mobile terminals, WML script – a lightweight scripting language similar to JAVA Script™, wireless telephony application (WTA, WTAI) telephony services and programming interfaces, and content
20 formats – a well known set of data formats including images, phone book records and calendar information.

Data can be downloaded to the browser from a WAP server such as server 18

shown in Figure 1. The server 18 provides WML decks of cards,

- 25 corresponding to conventional pages of HTML such that a deck can be downloaded to the handset 1 and the individual cards manipulated for display by means of the keys 3, 4. The server 18 is accessed through a gateway 19 which acts as a proxy server. The handset 1 can access the gateway 19 by dialling a predetermined telephone number. The data service provider which

30 operates the server 18 has a predetermined identity. In this example, the service provider for WAP server 18 comprises the operator of the network PLMN A, namely Teleco. A. PLMN B is provided with a similar gateway 20

and server 21 operated by Teleco. B. In this example, the networks are both GSM networks with PLMN B in a different country from the home network PLMN A. It will however be understood that the invention is not restricted to GSM and can be used with any network protocol providing a suitable bearer.

5

In order to simplify operation of the browser on the handset 1, settings for the browser are sent as a push to the handset 1 from the network when the handset is initially connected to the network PLMN A. Thus, the network provides the handset with telephone numbers and IP addresses for servers that the user can access to receive WAP data. Furthermore, these settings for the handset can be updated by subsequent pushes from the network.

10

Figures 3a – c illustrate displays presented to the user of handset 1 during the process of making a connection to a WAP server.

15

Figure 3a illustrates a situation where the handset 1 is in idle mode, in communication with PLMN A. A banner 22 "Teleco. A" indicates that the handset 1 has registered with the cellular network PLMN A. The display includes a conventional battery charge display 23 that indicates the remaining capacity of the battery as a bar chart, together with display 24 which indicates the signal strength received from PLMN A. Display 25 comprises a digital clock operated by the controller 8 shown in Figure 2. Legends 26, 27 – "menu, names" indicate the functionalities attributed to soft keys 4a and 4b as shown in Figure 1.

25

Then, the user operates the keys 4a, 4b to select the WAP browser, which is displayed as shown in Figure 3b. The user then selects the pre-loaded settings corresponding to WAP server 18. The handset 1 then automatically dials the telephone number associated with the gateway 19 for server 18 in order to establish a data exchange between the browser 1 and the WAP server 18, with the WAP gateway 19 acting as a proxy server for the data interchange process.

Whilst the connection is being made, a display as shown in Figure 3b is provided for the user of the handset 1. An animated bar chart 28 indicates that the connection is being made and a banner 29 is provided indicating that
5 the connection is being established.

When the connection to server 18 is completed, a deck corresponding to the home page for the server is downloaded to the browser on handset 1. The first page of the deck is shown in Figure 3d.

10

Whilst this prior art process is generally satisfactory, it will be seen that whilst the connection is being established, the user is provided with a display as shown in Figure 3c which gives no indication as to the server to which connection is being made. The connection may take of the order of 2–45
15 seconds to become established i.e. the display shown in Figure 3c may be shown for this period of time before the display of Figure 3d become available to the user.

This can give rise to a problem in certain circumstances. For example, when
20 the handset roams to PLMN B, the handset 1 will have registered with Teleco B. However, the previously loaded WAP setting in handset 1 are configured to make a connection to WAP gateway 19. Thus, when the browser is selected as shown in Figure 3b and web access is selected in accordance with the pre-loaded settings, a connection will be made to WAP gateway 19
25 through PLMN B. This will involve an international call because the handset has roamed from PLMN A to PLMN B, in another country. However, to mitigate the costs, the user could instead call WAP gateway 20 associated with PLMN B i.e. a local gateway, to obtain corresponding services to those provided by server 18 connected to PLMN A. Whilst the connection is being
30 made according to the preloaded settings, the user is unable to determine the actual gateway being called. It is only when the display of Figure 3d is actually shown to the user, that it will be appreciated that the setting in the

handset has caused a relatively expensive international call to server 18 to be set up. If the user wishes to save money, the call is terminated and another call is made using an appropriate address for gateway 20 associated with PLMN B, at a local call rate. The re-calling process is relatively time consuming and inconvenient, and furthermore, will have incurred a charge at international rates for the terminated call.

An example of the invention will now be described which seeks to overcome this problem. Referring to Figure 4, it will be understood that the previously described configuration gives rise to a WAP client process 30 at handset 1, a WAP gateway process 31 at the called WAP gateway and a WAP server process 32 at the server to which connection is established. A data interchange between the client, gateway and server processes 30, 31 and 32 will now be described. As previously explained, the WAP enabled handset is pre-loaded with browser settings in order to simplify its operation. Thus, referring to Figure 4, at step S1 a so-called WAP push is carried out so that the server 30 transfers settings about itself via gateway 31 to the WAP client 30 at the handset 1. These settings are stored in memory 10 (Figure 2). The general configuration of the phone settings is shown in Table 1.

20

Table 1

Server	IP Address	MSISDN	SP graphical information	Other Data
Teleco A (18)	abc	+33xyz	graphic for A	dialling graphic
Teleco A (20)	pqr	+44xyz	graphic for B	dialling graphic
.....
.....

Settings for a number of different servers are provided to the handset so that it can access them individually. For each server e.g. server 18, the identity of the server is provided, its corresponding IP address, together with an

international subscriber dialling number (MSISDN). Also, according to the invention, graphical information is provided corresponding to the identity of the server. The pushed phone setting information may also include an animated dialling graphic to be explained in more detail hereafter, together with other 5 data according to the WAP protocol for defining security settings and other functions not directly relevant to the example of the invention.

When the user subsequently decides to access a WAP server, in order to establish a WAP session, steps S2 - S9 are carried out. In the following 10 example, it is assumed that the handset 1 is in communication with PLMN A. The various process steps associated with the session are shown in Figure 5 and corresponding displays on the display 5 of handset 1 are shown in Figure 6.

At step S2 (Figure 4), the user operates the soft keys 4 to request connection 15 to the web server for Teleco A, namely server 18 (Figure 1). As a result, a request is sent from client process 30 via the gateway process 31 to WAP server process 32. In this example, the WAP gateway process 31 resides at gateway 19 in Figure 1 and the server process 32 resides at server 18.

20 As shown in Figure 6a, the display 5 provides an initial display corresponding to Figure 3a, indicating an idle mode connection to PLMN A. When the request is sent at step S2, the browser is started on the handset, as shown at step S3 in Figure 5.

25 Then, as shown at step S4, the server identity graphical information for server 18 is obtained from memory 10 shown in Figure 2, the information having been sent as a push at step S1 during the initial set-up of the handset (see Table 1). The retrieved graphical information is then displayed on display 5, as shown at step S5, and as illustrated in Figure 6c. The graphical 30 information consists of an animated dialling graphic 33, in this example, a representation of the earth, which rotates whilst the connection is being established between handset 1 and server 18. The display also includes a

banner 34, "waiting for reply" to notify the user that the connection is in the process of being made. The display further includes graphical information which identifies the service provider for the server 18, namely Teleco A. This is provided in a graphical form which may be itself animated.

5

Thereafter, the connection between the handset 1 and server 18 becomes established so that the home page for the web server becomes downloaded to the browser of handset 1, as shown in Figure 6d. The downloading of the home page is shown as step S6 in Figure 4 and the corresponding display of

10 the deck associated with the home page is shown at step S7 in Figure 5.

Thereafter, the user can select a link and a corresponding URL is uploaded to the server at step S8 shown in Figure 4. Corresponding downloaded data in the form of a WML deck is shown at step S9.

15

Thus, in accordance with the invention, whilst the browser is establishing a connection to server 18, the user is informed of the identity of the service provider for server 18 by means of the graphical display 35, as shown in Figure 6c. Furthermore, the user is provided with an indication by means of

20 the graphic 33 that the connection is in the process of being made.

It will therefore be understood that when the user roams from PLMN A to PLMN B, as previously described, identity of the service provider for a server associated with of the pre-loaded settings in the handset 1 can immediately

25 be detected once an attempt is made to connect to the server. The user is immediately advised by means of the display shown in Figure 6c, that the connection is being attempted back to the server A associated with home network PLMN A, rather than attempting to make a cheaper connection to the local server 21 associated with roamed PLMN B. Thus, the user can
30 immediately abort the connection and make an alternative server choice.

The display shown in Figure 6c also gives rise to an advantage when more than one web server is provided for an individual PLMN, offering corresponding services, and one of the service providers is cheaper than the other. Thus, the handset when operating according to the prior art procedure

5 shown in Figure 3 does not identify to the user the server to which connection is being made. Thus, the user does not know until the connection has been made whether it has been established with the relatively cheap or expensive service provider. The user is only informed of this information once the connection has been made, as shown in Figure 3d. However, in accordance
10 with the invention, in this situation, the user is provided with the identity of the server to which connection is being made, whilst the connection is being established as shown in Figure 6c and does not have to wait until the display of Figure 6d to determine the identity of the sever to which connection has actually been made.

15

Many modification and variations of the described example of the invention will be evident. For example, whilst the invention is being described in relation to the a GSM system, it will be understood that it could be used with any wireless network suitable for WAP information interchange such as UMTS,
20 CDPD, CDMA, PDS, PDC, TDMA, DECT and the like. Furthermore, the invention may make use of any suitable bearer available under the above networks.

Furthermore, the provision of data concerning the identity of the service
25 provider for the individual servers need not necessarily be supplied in a push as an initial setting up step for the mobile device. Instead, it may be supplied in response to each individual request for connection to the server. The data need not necessarily be supplied on an SMS or USSD bearer but can use any suitable bearer, depending upon the availability under the particular network.

30

It will be understood that the invention is not restricted to mobile telephone handsets and can be used with PDAs, portable computing apparatus and

other mobile devices. Furthermore, the network need not necessarily be cellular.

Claims

1. A mobile telecommunications device operable as a client for a server that acts as a data service provider, including a transmitter to transmit a request to connect the client to the server through a mobile telecommunications network, and a display configured to display information to the user of the mobile device, whilst the connection is being established, representative of the identity of the data service provider for the server to which the connection is being made.
- 10 2. A device according to claim 1 wherein the display is configured to display said information as graphical information.
- 15 3. A device according to claim 1 or 2 including a memory to receive data corresponding to the displayed information from the network.
4. A device according to claim 3 wherein the data is stored the memory prior to commencement of the making of the connection and retrieved for display whilst the connection is being made.
- 20 5. A device according to claim 4 wherein that data forms part of an ensemble of setting data provided for the device at initialisation thereof.
- 25 6. A device according to claim 4 wherein the data is provided thereto in response to a request to make the connection.
7. A device according to any preceding claim wherein the display is operable to provide an indication that the connection is in the course of being made.

8. A device according to claim 7 wherein the indication comprises a graphical image that is animated whilst the connection is being made.
9. A device according to any preceding claim which is WAP enabled.
5
10. A device according to any preceding claim that comprises a mobile cellular telephone handset.
11. A device according to any preceding claim that comprises a PDA.
10
12. A method of connecting a mobile telecommunications device as a client to a remote server that acts as a data service provider, comprising transmitting a request to connect the client to the server through a mobile telecommunications network, and whilst the connection is being established, displaying information to the user of the mobile telecommunications device representative of the identity of the data service provider for the server to which the connection is being made.
15
- 20 13. A method according to claim 12 including receiving data corresponding to the displayed information downloaded through the network to the device in response to the request to connect the client to the server.
- 25 14. A method according to claim 12 or 13 wherein the displayed information comprises graphical information.
15. A method according to claim 14 wherein the graphical information is stored in the mobile telecommunications device and retrieved for display whilst the connection is being made.
30

16. A method according to any one of claims 12 to 15 including displaying an indication to the user of the device that the connection is in the course of being made.

5 17. A method according to claim 16 wherein the indication comprises a graphical image that is animated whilst the connection is being made.

10 18. A server that acts as a data service provider for a mobile telecommunications device operable as client, including means responsive to a request to connect the client to the server through a mobile telecommunications network, to supply data corresponding to the identity of the data service provider to the device so as to permit the device to display information, whilst the connection is being established, representative of the identity of the data service provider
15 for the server.

20 19. A method of operating server that acts as a data service provider for a mobile telecommunications device operable as a client through a network, comprising supplying data corresponding to the identity of the data service provider such as to permit the device to display information, whilst the connection is being established, representative of the identity of the data service provider for the server.

25 20. A method according to claim 19 including supplying the information as part of an ensemble of settings data for initialising the device when connected to the network.

30 21. A method according to claim 19 including receiving a request for the connection to be made and supplying the information in response thereto.

22. A mobile telecommunications network configured to provide a connection between a server that acts as a data service provider and a mobile telecommunications device operable as a client for the server, the network being configured to convey data corresponding to the identity of the data service provider to the device such as to permit the device to display information, whilst the connection is being established, representative of the identity of the data service provider for the server.
- 5
- 10 23. A mobile telecommunications device for use as a client for a remote server, substantially as hereinbefore described with reference to the accompanying drawings.
- 15 24. A method of connecting a mobile telecommunications device as a client to a remote server that acts as a data service provider, substantially as hereinbefore described with reference to the accompanying drawings.
- 20 25. A server substantially as hereinbefore described with reference to figures 1 and 4 of the accompanying drawings.
26. A mobile telecommunications network substantially as hereinbefore described with reference to figures 1 and 4 of the accompanying drawings

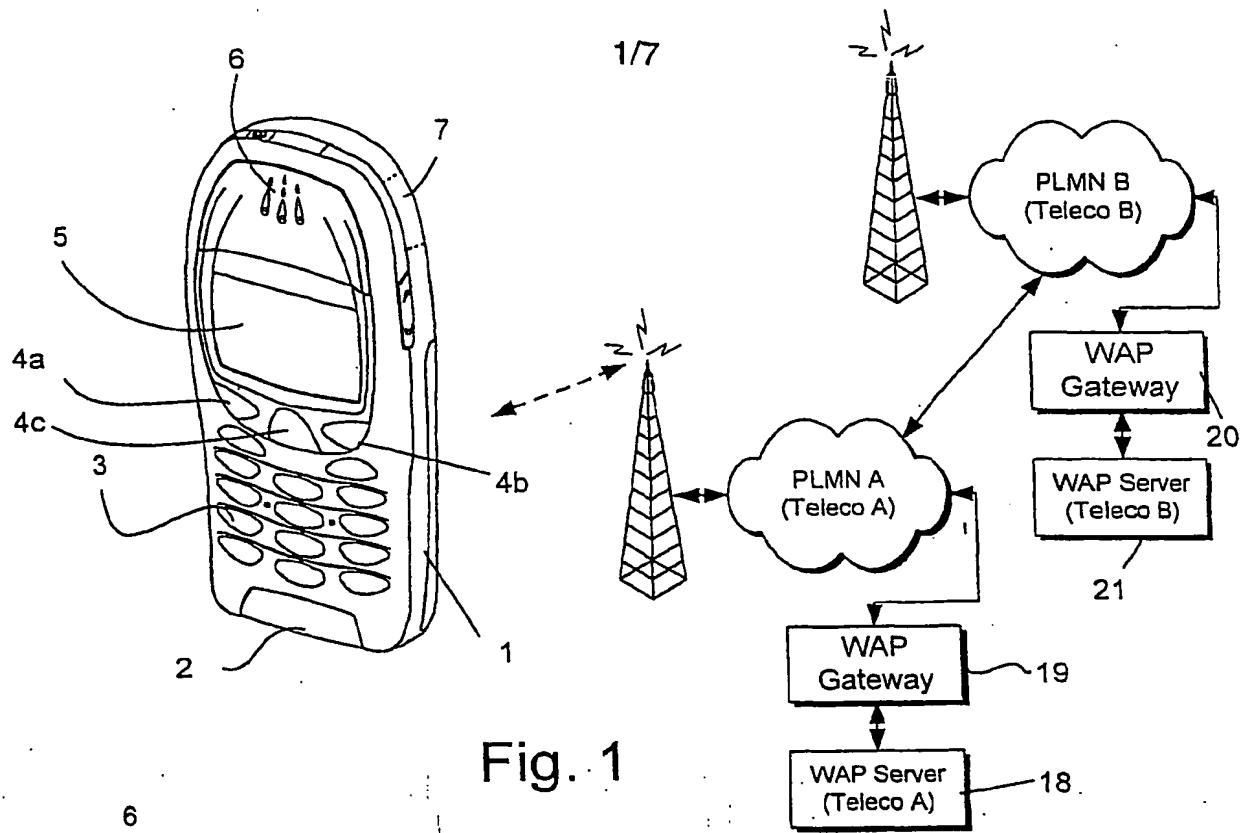


Fig. 1

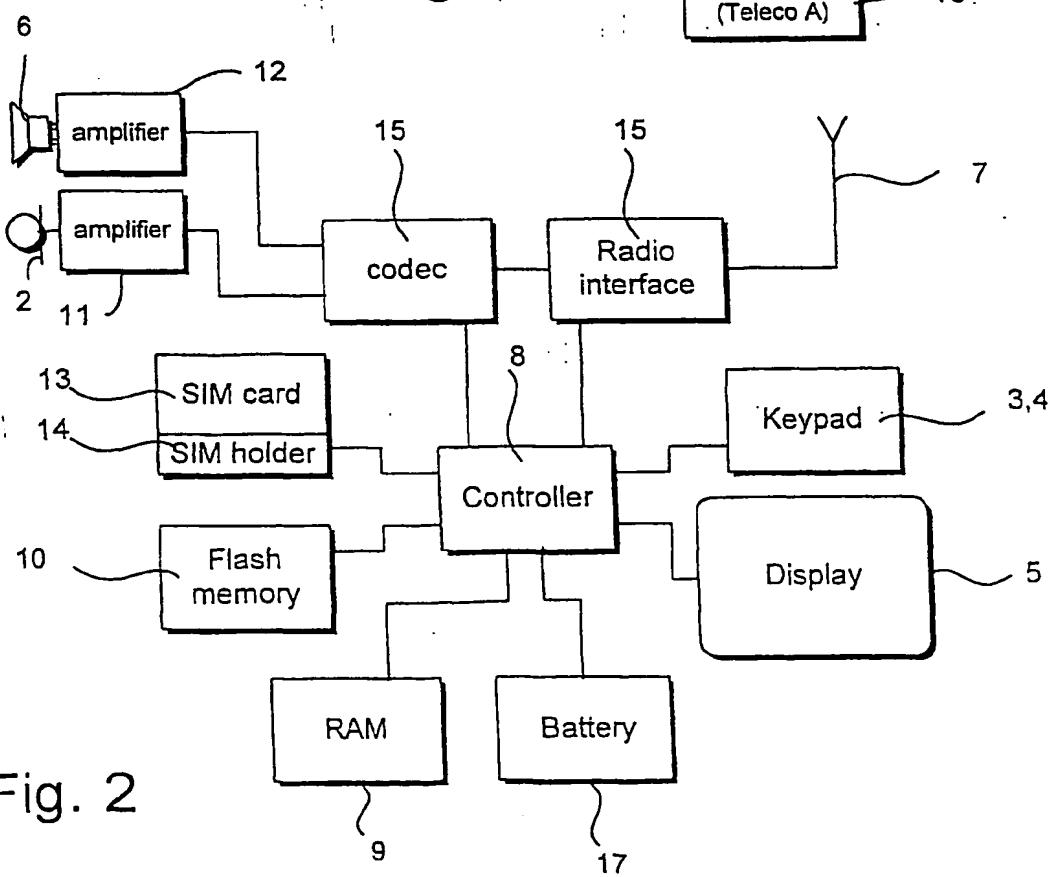


Fig. 2

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Fig. 3A

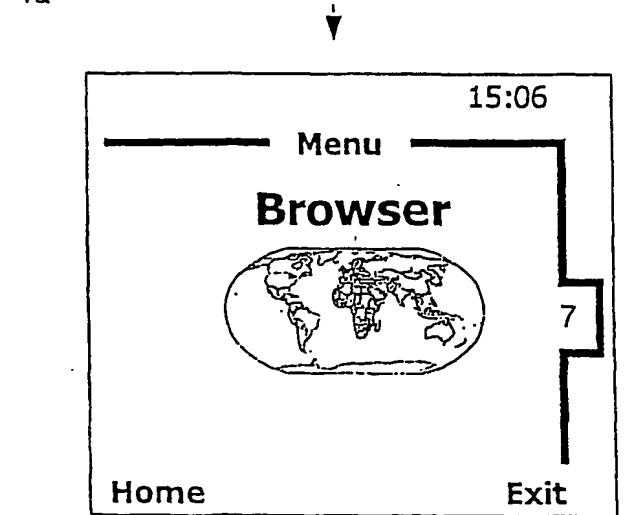
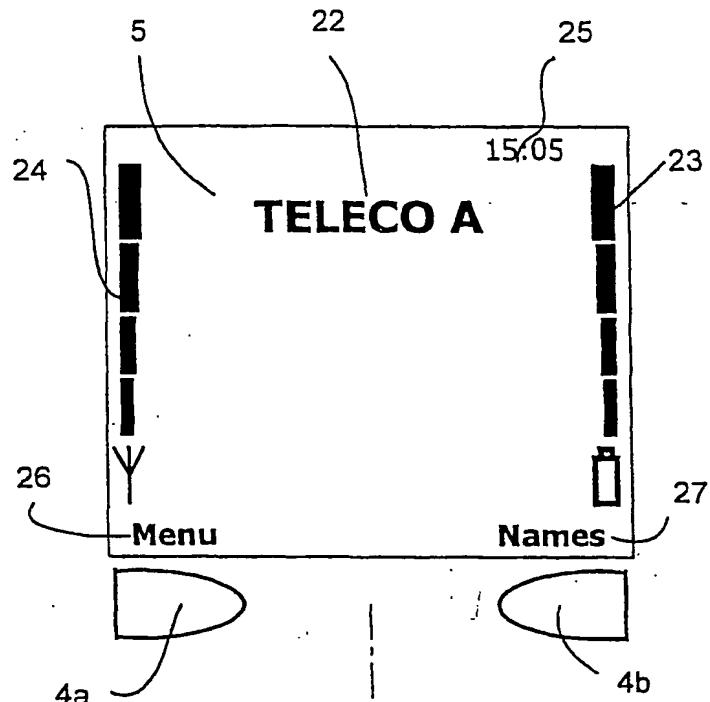


Fig. 3B

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Fig. 3C

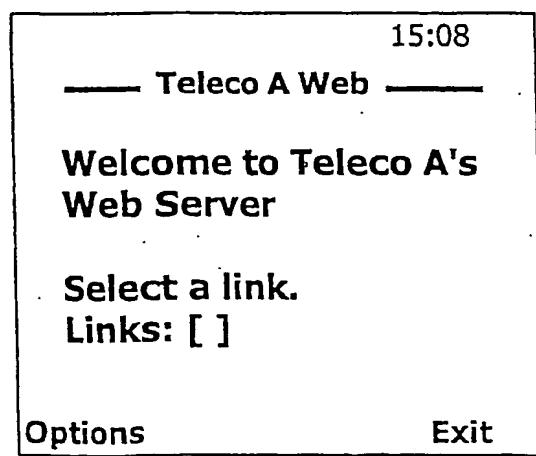
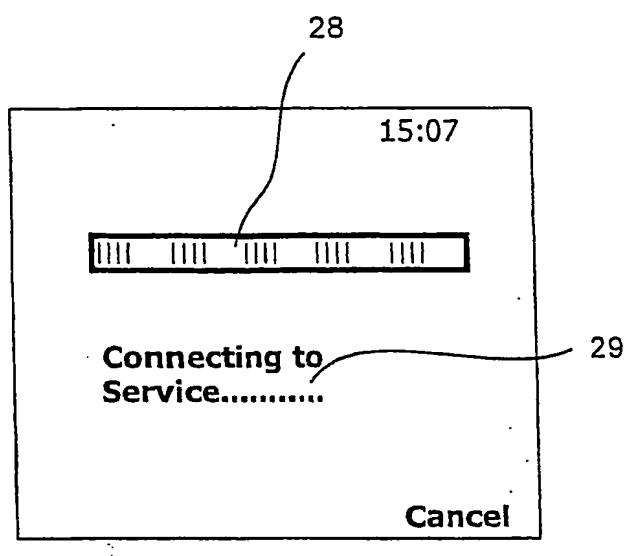


Fig. 3D

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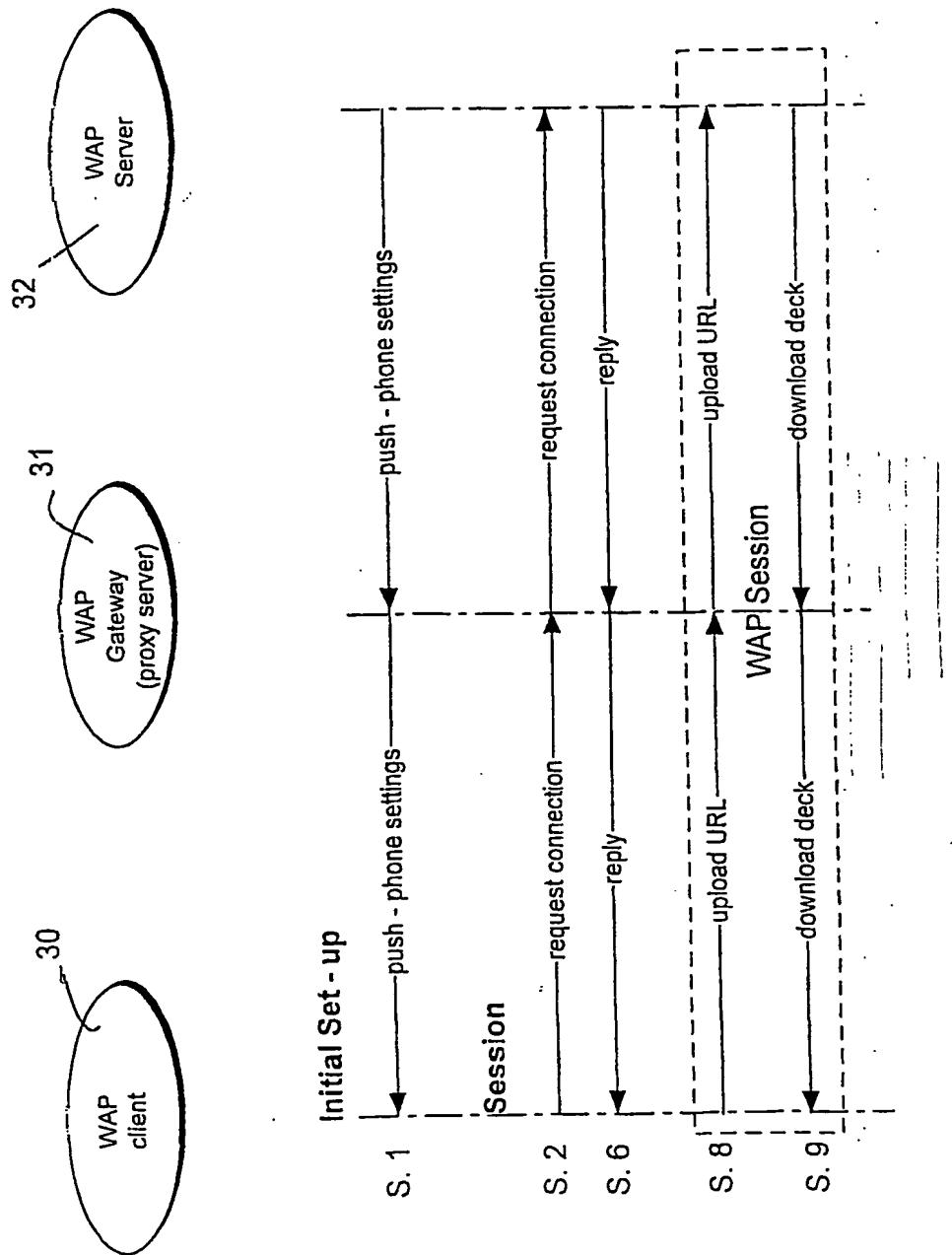


Fig. 4

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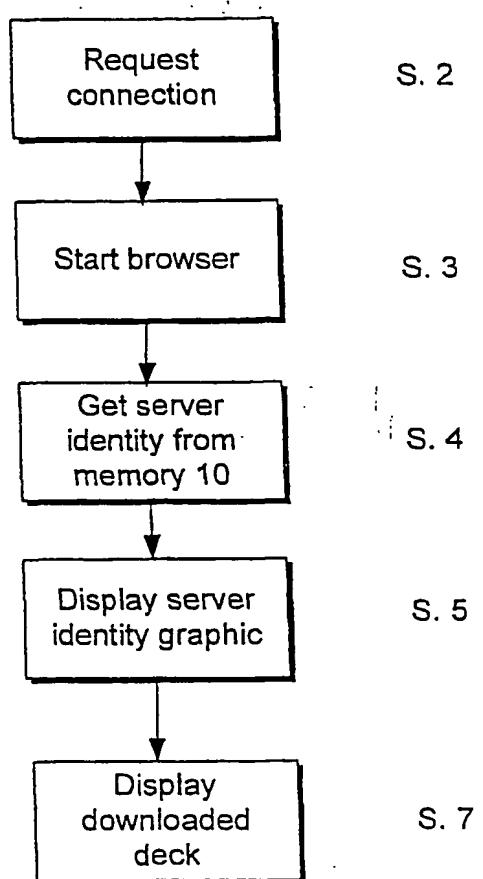


Fig. 5

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Fig. 6A

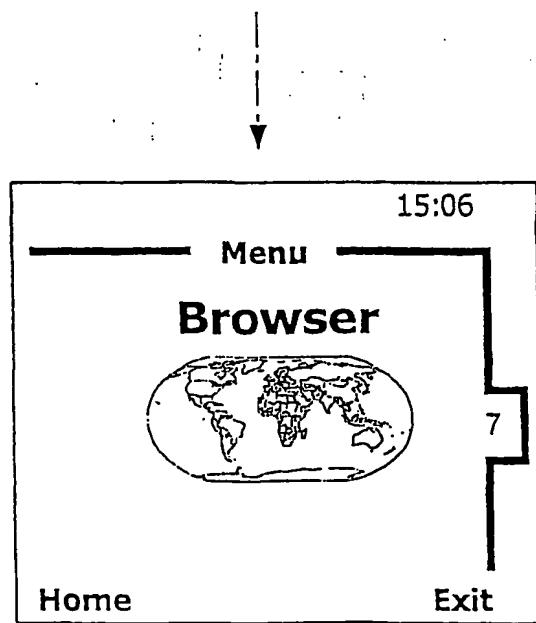
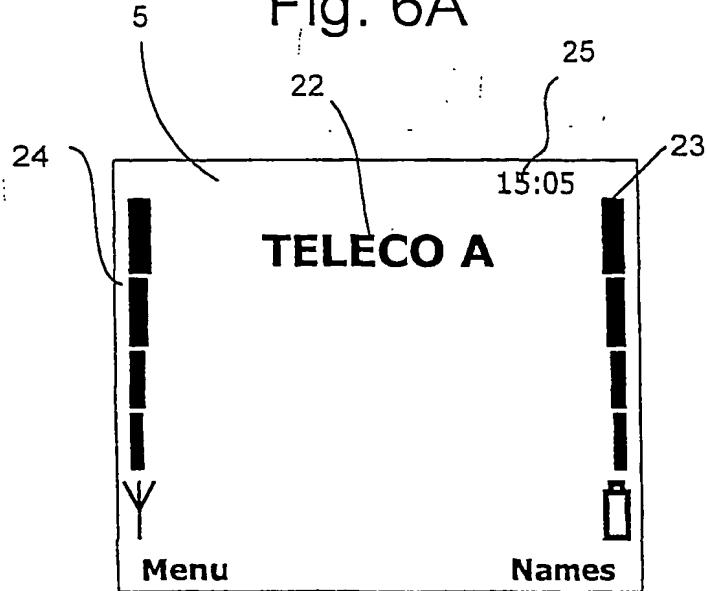


Fig. 6B

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Fig. 6C

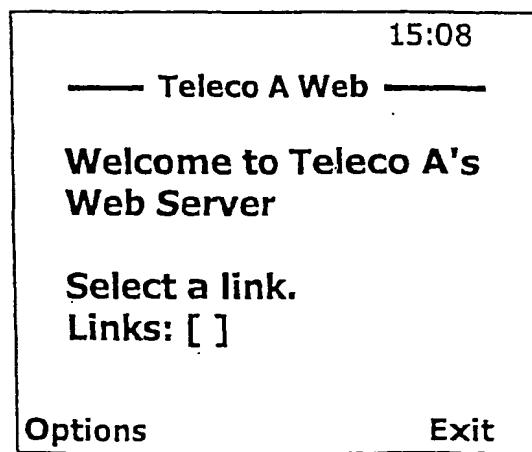
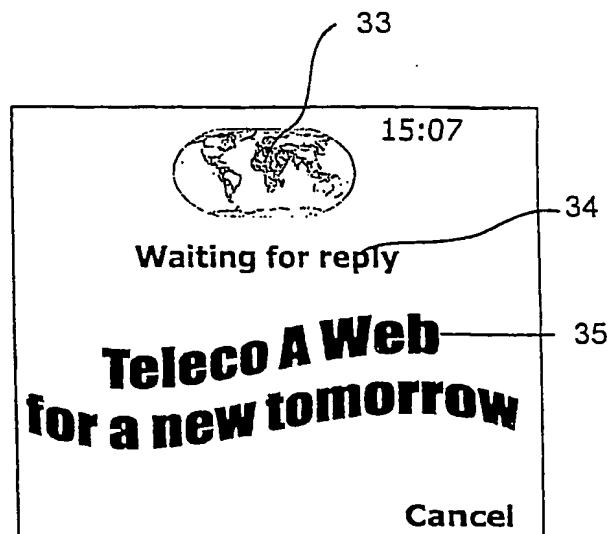


Fig. 6D

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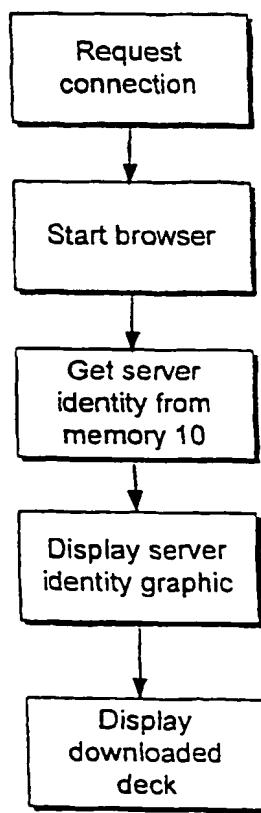
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[Continued on next page]

(54) Title: DISPLAYING SERVICE PROVIDER IDENTITY



S. 2

S. 3

S. 4

S. 5

S. 7

(57) Abstract: A mobile cellular telephone handset (1) is WAP enabled. Browser connection settings are configured so that whilst connection is being made to a WAP server, the user is provided with a graphical display that indicates the identity of the service provider for the server.

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(88) Date of publication of the international search report:
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 01/04905

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04Q 7/32, H04Q 7/38, H04M 3/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 0004737 A1 (TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)), 27 January 2000 (27.01.00), page 12, line 5 - line 11, claim 9 --	1-22
A	WO 0014941 A1 (SWISSCOM AG ET AL), 16 March 2000 (16.03.00), abstract --	1-22
A	US 5970133 A (STEVEN CHARLES SALIMANDO), 19 October 1999 (19.10.99), abstract -- -----	1-22

Further documents are listed in the continuation of Box C.

See patent family annex.

<ul style="list-style-type: none"> * Special categories of cited documents "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed 	<ul style="list-style-type: none"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
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Date of the actual completion of the international search

Date of mailing of the international search report

29.11.2001

14 November 2001

Name and mailing address of the International Searching Authority
 European Patent Office P.B. 5818 Patentlaan 2
 NL-2280 HV Rijswijk
 Tel(+31-70)340-2040, Tx 31 651 epo nl
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 Facsimile No.

Authorized officer

Roland Landström/mj
 Telephone No.

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/EP01/04905**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: **23-26**
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
References to the description or drawings are not allowed under PCT Rule 6.2(a).

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/EP 01/04905

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 0004737 A1	27/01/00	AU	4904299 A	07/02/00
		CN	1309874 T	22/08/01
		DE	19831407 A	20/01/00
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